Departmental Missouri Risk-Based Corrective Action (MRBCA)

New Environmental Guidance
From the Missouri Department of Natural Resources (MoDNR)
That May Impact Your Site

Presented By:_____

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Understanding How the New MRBCA Process May Help You

The following presentation was developed by the

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Public Outreach Subgroup

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Environmental Concerns During A Property Transaction

Conventional Approach

- Phase I Environmental Site Assessment (ESA)
- Phase II ESA
- Remediation

MRBCA Approach

- Phase I ESA
- Phase II ESA
- Risk Evaluation
- Risk Management

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What Types of Contaminants Might We Encounter During Phase I/II ESA?

Chemicals from Industrial Processes

Metals

Contaminated Soil and Groundwater

Mold

Underground Storage Tanks

Asbestos

Lead Based Paint

PCBs

Etc.

MRBCA focuses on subsurface Impacts….

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Common Types of Sites Addressed by MRBCA

- Dry Cleaning Facilities
- Commercial Properties
- Light Industrial or Manufacturing Sites
- Chemical Processing or Distribution Facilities
- Brownfield Sites
- State-lead Superfund sites
- Some RCRA sites
- Gasoline Stations (*)

* Gas Stations have a separate MRBCA process designed for them. MRBCA for PetroleumTanks sites is similar to the departmental MRBCA process.

What Did We Do Before???

- Soils and groundwater were cleaned up to conservative standards

- Groundwater was cleaned up to drinking water standards

…But nobody's drinking the groundwater at MY site!!!!!

….So what?

- Sometimes deals fell through
- Sometimes owners spent large sums to clean up to unnecessarily conservative standards
- Sometimes properties sat vacant and unused

Legislators to the Rescue!

- S.B. 334 directed the Clean Water Commission to determine if risk-based remediation of groundwater was appropriate for a particular site.
- 2002-2004: MRBCA Stakeholders' Workgroup convened to provide input as guidance was developed.

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A Fundamental Paradigm Shift

- Conventional Approach:

  -How much chemical mass can we remove?

- MRBCA Approach:

  -How much chemical mass can we safely leave behind?

  -To remain protective, how do we ensure that future generations are aware of any chemicals left behind?

Basic Elements of MRBCA Risk Management

- Understanding the Existing Conditions
  - Toxicology of Chemicals
  - Subsurface Conditions (Fate and Transport)
- Quantifying Risk Associated With Existing Conditions
  - Modeling Risk with Site Specific / Realistic Inputs
  - Establishing reasonably anticipated future land use
- Managing Risk (and Continuing Your Project)
  - Contaminant Treatment to Risk-Based Target Levels
  - Engineering/Institutional Controls
  - Information tracking

More Specific Elements of the MRBCA Process

- Comparison to Default Target Levels or DTLs
- Collection of adequate data
- Development of a CSM, or Conceptual Site Model
- Tiered Evaluation
- Models used to quantify risk (carcinogenic and non-carcinogenic)
- Institutional Controls
- Engineering Controls
- Ecological Risk Evaluation

MRBCA Associates Risk with Exposure to Unacceptable Levels of a Compound

- The first step to evaluating risk is to identify completed exposure pathways.

Conceptual Site Model

The CSM links the RECEPTOR with the CHEMICAL by means of a PATHWAY

Conceptual Site Model

- Receptors
  - Resident Adult
  - Resident Child
  - Non-residential Worker
  - Construction Worker

Each receptor has exposure factors specific to them

- Pathways
  - Ingestion - groundwater
  - Ingestion - surface water
  - Dermal contact with water
  - Inhalation of indoor vapors
  - Ingestion, Inhalation, and dermal contact with surficial soils
  - Others may be identified in tiered evaluations

Data Collection

- Chemicals of Concern (COCs)
  - Soil Samples
  - Groundwater Samples
  - Surface water Samples
- Geotechnical Parameters
  - Porosity
  - Dry Bulk Density
  - Organic Content
  - Other
- Temporal and Spatial Considerations
  - Adequate Delineation
  - Plume Stability

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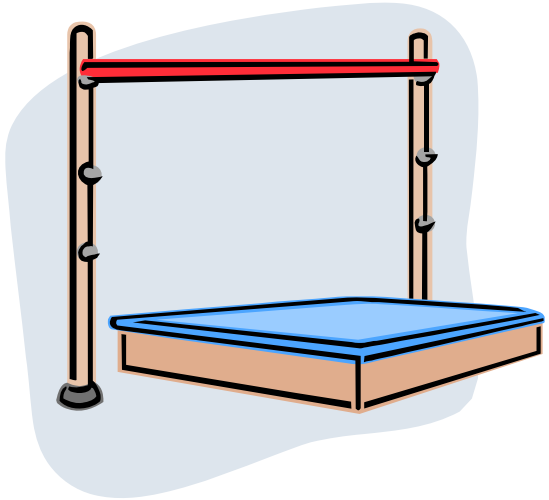
Comparison of Site Data To Default Target Levels (DTLs)

- Mathematical models used to simulate exposures
- Most conservative assumptions (model inputs) used to develop DTLs
- Protective of human health assuming conservative scenario
- Screening step used to eliminate COCs that do not need to be evaluated



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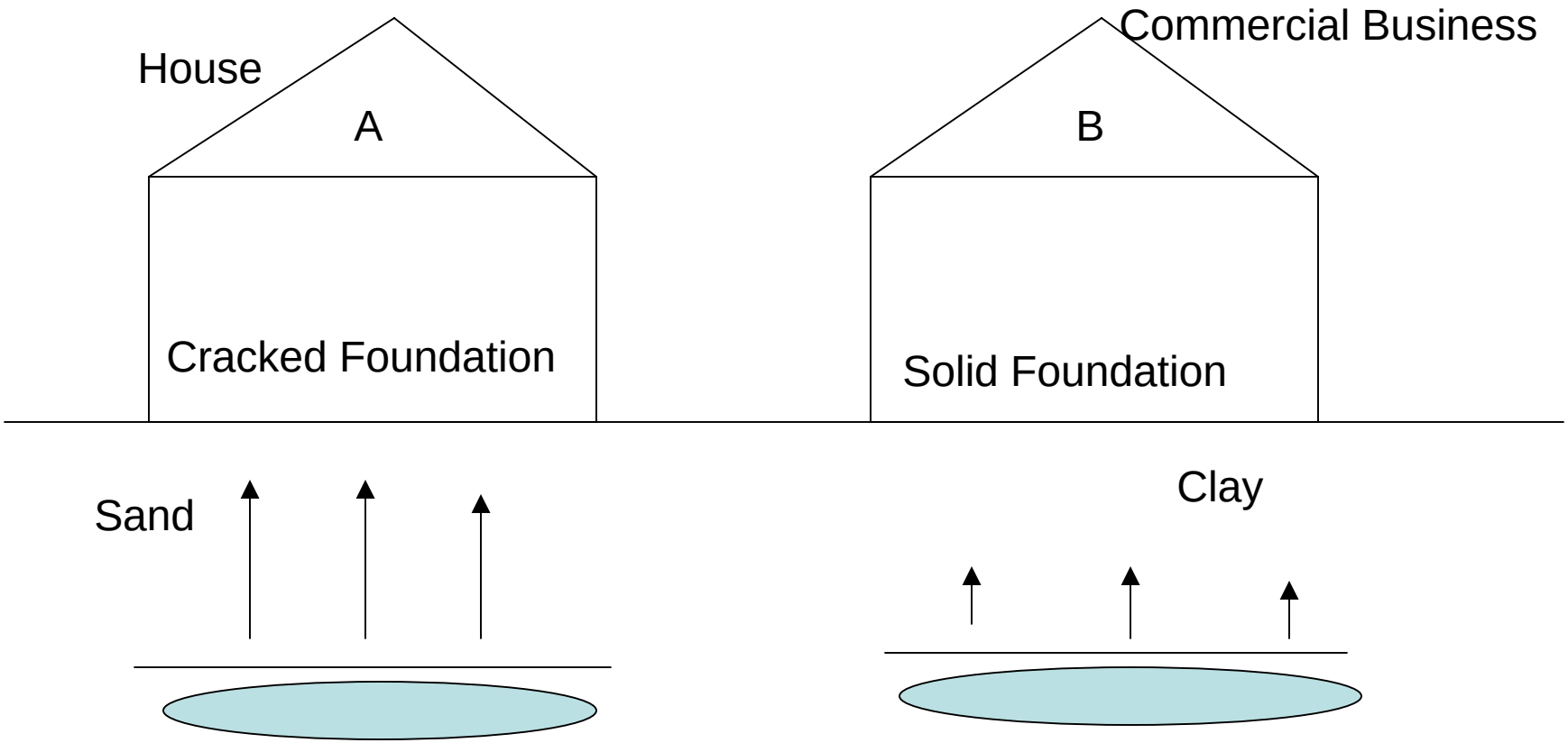
We're Above DTLs, Now What?

- The property owner can clean up to conservative levels
  - May be very expensive and time consuming
- Risk may be managed to avoid current and reasonably anticipated future exposure
- Risk-Based Tiered Evaluation may be performed
  - Evaluate site-specific conditions to establish a target that is protective, but less conservative
  - Adjust model inputs to reflect actual conditions

Example – Which Scenario Has the Higher Risk Associated with Indoor Air Inhalation of Chemicals?
Should these spills be cleaned up to the same standard?



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Risk-Based Target Levels

- By changing model inputs, site-specific risk-based target levels (RBTLs) can be developed and used as remediation goals.
- As more and more site specific values are put into the models, RBTLs become more and more appropriate to a specific site.
- MRBCA is a technically defensible approach for establishing remediation goals that may be less conservative, but still protective.

Next Step: It's a choice!

- Compare actual data to RBTLs,
- Manage risk,
- Develop and clean up to site-specific RBTLs, or
- Continue tiered evaluation.

Risk Management Tools

- Institutional Controls
  - Deed Restrictions / Land Use
  - City Ordinances
  - Zoning Restrictions
  - Drilling Restrictions
  - Other

Risk Management Tools

- Engineering Controls
  - Fence
  - Asphalt, clean soil or concrete cap
  - Vapor Barrier / Liner
  - Other

Ecological Risk Assessment

- Required to evaluate risks to non-humans (e.g. waterways, wetlands, wildlife)
- Generally not a lengthy process, especially in urban areas

Example of Site in MRBCA

- Insert Example Appropriate for Presenter

Benefits

- Protective of human health, public welfare and the environment
- Predictable, consistent and transparent process
- Tiered evaluation provides flexibility
- Cost-effective cleanups
- Incentive to develop contaminated property
- Less pressure on “green spaces”
- More sites completed

Working Together Toward a Solution
A message from MDNR

- The Missouri Department of Natural Resources acknowledges the extensive assistance from the Risk-Based Remediation Rule Workgroup.
- Workgroup members represented industry, private consultants and contractors, citizen organizations, and state, federal and local agencies.
- These public and private partners have provided invaluable assistance over several years and in many aspects of developing the departmental MRBCA process.

- http://www.dnr.mo.gov/alpd/hwp/mrbca/mrbca.htm